

DIELECTRIC ANTI-REFLECTIVE COATING SURFACE TREATMENT TO PREVENT
DEFECT GENERATION IN ASSOCIATED WET CLEAN

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ABSTRACT

A method for preventing the formation of watermark defects includes the steps of forming a pad oxide, a silicon nitride layer and a silicon oxynitride layer over a semiconductor substrate. A photoresist mask is formed over the resulting structure, with the silicon oxynitride layer being used as an anti-reflective coating during exposure of the photoresist material. An etch is performed through the photoresist mask, thereby forming a trench in the substrate. The photoresist mask is stripped, and the silicon oxynitride layer is conditioned. For example, the silicon oxynitride layer may be conditioned by a rapid thermal anneal in the presence of oxygen or nitrogen. A wet clean step is subsequently performed to remove a native oxide layer in the trench. The conditioned silicon oxynitride layer prevents the formation of watermarks during the wet clean process.